

upon the sun, and while it had notched the disc. The planet appeared to be surrounded by an annulus of reddish hue, and over the central parts there was diffused a patch of faint light. The region of the disc just within the margin was very black. These effects may, however, have been purely telescopic. I used a reflector of 4-inch aperture, with which the definition was not all that could be desired. There were very few of the ordinary sun-spots visible. A small irregular group lay slightly to the south-west of the centre, and another with much feculæ, near the eastern limit, but they were of very insignificant character, and not at all comparable to some of the fine spots which have been recently visible on the solar surface. To an observer accustomed to the appearance of these objects, the view of Venus now in transit must have been of extreme interest, and he could not fail to be struck with the marked difference between the black circular disc of the planet, and the more irregular and far less intense forms of the ordinary sun spots. As the transit progressed, the sky continued clear, so that it could be watched until near sunset, but the telescopic view became less effective, owing to increasing atmospheric undulation, which, as usual with objects at low altitudes, greatly impaired the definition. W. F. DENNING

Bristol, December 9

SOME parts of the transit were well seen here. I used a $3\frac{1}{2}$ Merz refractor, power 60. The external contact was excellently seen. I watched for those peculiar phenomena (black drop, &c.) which have created so much interest, but was able to see nothing of them. At the moment of external contact, I had the point of impact in the centre of my field, and the planet indented the edge of the sun with a black and perfectly circular segment, disturbed only by the "boiling" appearance characteristic of the solar edge. I watched the planet advance upon the sun to within, I guess, a few seconds of internal contact, when unfortunately the sun became obscured by a small cloud. At the time of observation, so near was internal contact, that I could every now and then see the boiling appearance of the solar edge peeping out from behind the black edge of the planet; but no other distortion of the planetary or solar edge was observable, except what arose from the "boiling" appearance referred to. D. TRAILL

Raleigh Lodge, Exmouth, December 7

THE transit of Venus was perfectly seen here yesterday. The sky was overcast quarter of an hour before, but the first and second contacts took place on a clear disk, and the first was almost instantly apparent with a hand glass. The sky remained clear till considerably past three. Considering the total failure in London and Paris, one could wish that some trained observers had selected our south coast. HENRY CECIL

Bregner, Bournemouth, December 7

P.S. As a consequence of popular ideas and anticipations as to celestial phenomena having got "a little mixed" lately, my gardener asked me this morning "if I saw the star fall into the sun yesterday."—H. C.

THE transit was seen here to great advantage, the day being exceptionally fine, the sun shining brightly from about 9.30 till sunset, with the exception of a few passing clouds at noon, and one small cloud obscuring the sun from 2.30 to 2.35 p.m. According to the times and positions of the sun and planet, given in the *Nautical Almanack*, I had made a diagram as correct as I could of the sun with the path of Venus across his disc; but if I had relied entirely upon the diagram I should have missed the place of external contact, as I found afterwards I had drawn the position of Venus considerably too high. To make sure of my object I depressed the telescope so as to keep as much of the sun as possible out of the field of view, and only allowing a portion of his limb to appear, and at 2h. 3m. 11s. I picked up Venus

depicted against the sky, and just coming in contact with the sun's limb. Her disc appeared a trifle paler than the background, and was surrounded with a very thin circle of light which appeared a little wider on that side furthest from the sun. It was this light which attracted my attention, and enabled me to identify the planet. At 2h. 3m. 20s. the first *touch* of Venus upon the sun's limb took place. I now watched with much interest to see if it was possible to detect signs of an atmosphere to Venus—changing the eye-pieces. Sometimes I thought there were visible signs of it, but I would not say decidedly that it was so. I noted with some surprise that the planet appeared much smaller upon the sun than it did immediately previous to contact. At 2h. 23m. 31s. internal contact took place. The planet appeared to pass clear off and away from the sun's limb, without showing the least sign of a "black drop," or any appearance of a lingering connection between her limb and that of the sun. The telescope used is an equatorial with driving-clock, silvered glass reflector $8\frac{1}{2}$ -inch diameter and 7 feet focal length; eye-pieces ranging from 30 to 17c of magnifying power. I took three photographs between 2h. 35m. and 2.45, but the spring of my instantaneous shutter did not act as it should, and therefore the photographs are not so good as I could wish, but Venus can be readily seen upon the sun's image in the negative.

Silverton, Devon, December 9

R. LANGDON

NOTES

THE following are the probable arrangements for the Friday evening meetings before Easter, 1883, at the Royal Institution:—January 19, R. Bosworth Smith, M.A., The Early Life of Lord Lawrence in India; January 26, George J. Romanes, F.R.S., Recent Work on Starfishes; February 2, Sir William Thomson, F.R.S., The Size of Atoms; February 9, Moncure D. Conway, M.A., Emerson and his Views of Nature; February 16, Prof. William C. Williamson, F.R.S., Some of the Anomalous Forms of Primæval Vegetation; February 23, Walter H. Pollock, M.A., Sir Francis Drake; March 2, C. Vernon Boys, A.R.S.M., Meters for Power and Electricity; March 9, Prof. George D. Liveing, F.R.S., The Ultra-Violet Spectra of the Elements; March 16, Prof. Tyndall, F.R.S.

MR. H. O. FORBES, on his return to Amboina from his first visit to Timor-laut, writes as follows:—"Extended movements were impossible, so that my botanical collections are not very extensive, but the ornithological and anthropological parts are very good. I am now engaged in packing them up for despatch, and hope to send them off soon. My intention is to return to Timor-laut in a few days, if my health will permit, by the Government steamer which leaves for the Tenimber Islands. I shall settle in some more quiet spot than Ritabel. A full report on this interesting country shall be sent by next mail. One of the singular facts I observed is the immense herds of wild buffalo existing on the mainland of the island. They must have, of course been introduced, but by whom, and how long ago, is an interesting question. I was unable to get a specimen unfortunately. My wife, who accompanied me, aided me greatly, so that when I was down with fever (and the fever is of extreme severity) the work was still able to go on." Mr. Forbes' collections will be consigned to the Committee of the British Association for the exploration of Timor-laut, as arranged when the expedition was determined on.

THE Accademia delle Scienze dell' Istituto di Bologna has lately announced that a gold medal of the value of 1000 lire (say 40l.) will be presented "to the author of that memoir which, proceeding on sure data either of Chemistry or of Physics, or of Applied Mechanics, will indicate new and efficacious practical systems, or new apparatus for the prevention, or extinction of fires." Memoirs must be written in Italian, Latin, or French,

and sent in (in MS. or printed form, and in the usual anonymous way) before May 30, 1884.

ANOTHER well-known naturalist has passed away. Prof. Andrea Aradas, of Catania, died on November 1 last, after a long and laborious life, which was devoted to the study of marine zoology and palæontology. His publications were very numerous, and extended over nearly forty years. He was a man of great amiability as well as learning.

THE death is announced of Sir Thomas Watson, M.D., F.R.S., the eminent physician, at the age of ninety years.

ON Monday evening the annual dinner of the Professors and Members of the Royal School of Mines was held in the Victoria Room of the Criterion, Piccadilly. Mr. E. L. J. Ridsdale, late of the Royal Mint, presided. It was announced that Major-General Martin was about to retire, owing to ill-health. Prof. Huxley made a long and interesting speech, in the course of which he recalled the personal characteristics of the professors who filled the chairs at the school. Prof. Judd proposed "The Geological Survey," to which Dr. A. Geikie responded.

PROF. KENNEDY has issued invitations for an inspection of the experimental engine and other apparatus just completed at the Engineering Laboratory, University College, London. Prof. Kennedy draws attention to the fact that the laboratory was the first of its kind established in England, and was at the time of its establishment an entirely new departure in technical education in this country. Since that time (1878), its principle has been more or less formally adopted by all the recently-established technical colleges. A very large number of the leading engineers of the country have also formally expressed their approval of the scheme, which, too, came in considerable detail before the present Royal Commission on Technical Education. The additions now just finished to the Laboratory render it already probably the most complete of its kind in Europe.

A RECENT writer in the *China Review* exemplifies the difficulties surrounding interpretation from Chinese into English, or *vice versa*, by mentioning that the simple question, *Was he (or she) dead?* which occurs so frequently in inquests and other judicial proceedings, admits of a positive or negative reply according to whether the European or the Chinese idea as to when death occurs be followed. We believe that a man is dead when he has ceased to breathe, and when his blood no longer circulates; the Chinese consider him still alive whilst a trace of warmth lingers in the body. The two estimates may thus differ by several hours. Hence it was that in inquests in Hongkong the time of death formed a stumbling-block in almost every Chinese case. The medical evidence would show that the deceased must have been dead when brought to the hospital, while the relatives would swear he was alive at the gate. Subsequent inquiry showed that the general view among the Chinese was that a person is considered to be dead when the body is cold, and not before. It does not speak very well for the Chinese scholarship of the officials of Hongkong that it took about forty years to discover this important distinction.

AN aurora was seen in Belgium on October 2, and one feature of it was (according to M. Montigny) the formation of a broad luminous arc extending across the sky from east to west, and passing a little to the south of the zenith. After a little time it broke up and gradually disappeared. M. Montigny observed the stars during this aurora, and found his former conclusions (as to increased scintillation during auroras greater in winter, and in the northern region, and towards the zenith, &c.) confirmed. He notes, however, an interesting new phenomenon

of scintillation. For more than a year, when a magnetic perturbation has been observed to occur at Brussels Observatory, he has very often observed a simultaneous sudden increase in the scintillation. No auroral phenomena were reported at those times, as during aurora the increase is more marked for the north and west, and the circular line in the scintillometer becomes irregular. M. Montigny is prosecuting his study of the phenomena.

IN the same *Bulletin* of the Belgian Academy, with M. Montigny's paper (November 9-10) is a full description, by M. Tarby, of the aurora of October 2, as observed at Louvain. Besides the luminous arc referred to above (which moved towards the south), he notes that the aurora had not the pronounced red tint characteristic of large phenomena of this class; white streamers constantly predominated. The successive displacement of the manifestations was from east to west, by north, a direction presented in certain previous auroras (which he specifies); while the opposite direction was observed in others. M. Tarby tabulates several years' observations of aurora in Belgium, and finds striking confirmation of an observation of M. Quetelet's in 1870, that auroras (through some unknown periodic influence) tend to appear at about monthly intervals.

IN the pile-dwellings near Bobenhausen (Zürich), a hatchet made of pure copper has been discovered. Special importance is attached to this discovery by students of prehistoric archaeology.

THE fourth edition of the *Micrographic Dictionary* is now more than two-thirds completed. The book will always be an indispensable work of reference to the student of the lower forms of animal and vegetable life. Very little attempt appears, however, to have been made by the editors to keep pace with the advance of biological science during the eight years that have elapsed since the publication of the last edition; notwithstanding the number of new forms that have been discovered during that period, the work so far occupies rather less space than before. In order to test the extent to which recent knowledge has been incorporated, we turned to two or three of the cryptogamic articles. Under "Fungi," we find it still stated that "the structure of all fungi exhibits a well-defined separation into two parts, namely: (1) a *mycelium* . . . and (2) the *reproductive structure*, or *fruit*"; and this although Schizomycetes are given as one of the groups of fungi; while the classification of "Fungi" into "I. Schizomycetes; II. Phycomycetes; III. Hypodermiæ; IV. Basidiomycetes; V. Ascomycetes; and VI. Myxomycetes" is stated to be "that of Sachs (!) slightly modified." Under "Lichens," the theory of the symbiosis of algæ and fungi is dismissed in a few sentences, without adducing any of the evidence in its favour, as "one of the modern natural-history romances." A new paragraph appears under the head "Gongrosira," which is described as a genus of Chætophoraceæ, without any reference to its genetic connection with *Vaucheria*. These and similar deficiencies suggest the question how far the text can have been revised by the eminent cryptogamist whose name still appears on the title-page.

THE concluding volume of the new edition of "The Imperial Dictionary," edited by Mr. C. Annandale, has been issued with praiseworthy promptitude by Messrs. Blackie and Son. In a supplement Mr. Annandale has added a considerable number of words omitted from their places in the body of the work, including not a few scientific terms. In the Appendix are copious lists of classical, scriptural, and geographical names, foreign words and phrases. In the preface the editor explains his method, which we think rational and judicious, and which has led to an excellent result. The list of authors consulted for quotations contains about 2000 names.

THE French official paper publishes an *arrêté* from the Minister of Public Works requiring that all trains be furnished with continuous brakes, and if possible automatic.

THE inundation of the Seine, which had reached a level of about 6½ metres above the summer season, and has caused many disasters, has terminated abruptly by the cold weather which has set in with the new moon.

AT the last meeting of the St Petersburg Society of Naturalists, M. Beketoff reported that the expedition for the exploration of the Altai sent out during last summer was very successful. MM. Sokoloff, Polenoff, Nikolskiy, and Krasnoff have returned with very rich botanical, zoological, mineralogical, and geological collections. He added also that the appeal of the Society for botanical collections (addressing them to the St. Petersburg University) had been responded to. No less than eighteen very good collections had been received, among which one by the scholars of all *Realschulen* of Western Siberia merits special attention.

It is worthy of note that snow fell on Sunday in Madrid to the depth of one foot. It is said that no such weather has been experienced in the Spanish capital for twenty years.

THE diaries, pocket-books, cards, and the other useful and beautiful things issued by Messrs. De La Rue for the coming year are in all respects equal to those of which we were able to speak so highly last year. It would be difficult to imagine anything more beautiful of their kind than the cards, and what with Japanese beauties, flowers, birds, and insects, they might be utilised for giving the young ones a liking for natural history. The astronomical and other useful information contained in the diaries is as full and accurate as ever, and adds greatly to their value in our eyes.

AMONG the articles in the *Companion to the British Almanac* for 1883 are "Halley's Comet," by Mr. W. T. Lynn; "Modern Fish Culture" and "Fishery Exhibitions," by Mr. J. G. Bertram; "Insects Injurious to Agriculture," by Mr. W. E. A. Axon; "Electric Lighting," by Mr. L. T. Thorne; "The British Museum," by Mr. Charles Makeson; and a brief sketch of the Science of the Year, by Mr. J. F. Iselin.

HARTLEBEN, of Vienna, has sent us a catalogue of German works, some of which might commend themselves to those who may wish to entice their young friends to the study of German.

A GERMAN translation is announced of Dr. Ingvald Undset's "Study in Comparative Prehistoric Archaeology"; Meissner, of Hamburg, is the publisher, and the last number (23) of *Globus* contains an abstract of Dr. Undset's researches into the first appearance of iron in Northern Europe.

THE last number (vol. xvii. part 1) of the *Journal* of the North China Branch of the Royal Asiatic Society contains a short article by Dr. Guppy, R.N., on the Geology of the Neighbourhood of Nagasaki, and a few notes on the South Coast of Saghalin, by Mr. Anderson. The principal paper, occupying 180 pages, is on Annam and its Minor Currency, by M. Toda. Besides the portion devoted to numismatics, the author gives a short historical and geographical account of Annam, which should be valuable at the present time, when public attention is being strongly drawn by political events to these regions. Of the remaining papers, one, by Mr. Giles, discusses Chinese Composition; the other, by Dr. Hirth, describes a manuscript work written at the end of the last century, referring to the manner in which the Customs dues on foreign goods were then levied at Canton. It is called the "Hoppo" book, "Hoppo" being the title popularly given, even now, by foreigners to the principal native chief, or commissioner, of Customs at Canton.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus* ♀) from India, presented by Mr. W. Percy Laing; a Black-headed Lemur (*Lemur brunneus* ♂), a Black Lemur (*Lemur macaco* ♀) from Madagascar, presented by the I Company 3rd Battalion King's Royal Rifles; two Leopards (*Felis pardus* ♂ ♀) from India, presented by Lady Brassey; a North African Jackal (*Canis anthus*) from Tunis, presented by Capt. W. F. Wardroper; two Mexican Sousliks (*Spermophilus mexicanus* ♂ ♀) from Mexico, presented by Mrs. Simmonds; a Great Eagle Owl (*Bubo maximus*), European, presented by Mr. R. Leigh Pemberton; a Martinique Waterhen (*Porphyrio martinicus*) from Venezuela, presented by Mr. F. L. Davis; a Common Squirrel (*Sciurus vulgaris*), British, presented by the Hon. L. W. H. Powys; two Raccoon-like Dogs (*Nycterotes procynides*) from North-Eastern Asia, purchased.

OUR ASTRONOMICAL COLUMN

COMET 1882 *b*.—A number of very beautiful photographs of the great comet have been received from Mr. Gill during the past week. Several of them are remarkable for the amount of delicate detail that is brought out. Mr. Gill writes: "These photographs are interesting, not only as pictures of the comet, but they appear to me to show the possibility of making, with very little labour, a photographic *Durchmusterung* of the heavens." One of them taken on November 8 was exposed two hours, and shows all the 8th magnitude stars and the curious envelope extending 4° or 5° beyond the nucleus. This envelope was barely visible either to the naked eye or in the telescope.

Both Mr. Gill and Dr. Elkin had made a careful search for the cometary body seen within a few degrees from the nucleus of the great comet, by Prof. Julius Schmidt at Athens.

We have more than once pointed out that calculations based upon such observations as were available here at the time of writing, indicated sensible disturbance of the comet's motion at the perihelion passage. It is right, therefore, that we should state at once that this inference is hardly countenanced by calculations made by Mr. Finlay and Dr. Elkin at the Cape, who have had the advantage of more numerous, and probably in general more accurate and uniform series of observations. Mr. Gill writes: "The great comet is a puzzle. The whole question of its orbit now turns on which point of its nucleus should be observed. So long as the nucleus was single, *i.e.* from September 8 to September 28, Dr. Elkin has been able to represent its motion by parabolic elements within 3" of observation. But after September 28 matters change; the head begins to break up. What we took for the principal nucleus is no longer the centre of gravity. Finlay and Elkin's original elements are now nearly 2' out. Elkin's subsequent elements founded on observations September 8 to 28, give a place corresponding nearly with the end of the elongated nucleus (about 1½' long) furthest from the head. Now (November 21) the nucleus is getting very ill-defined. We have done the best we can in the matter, and shall continue the best observations we can, as long as the comet is visible."

COMET 1882 *c* (Barnard, September 10).—From an approximate orbit calculated by Mr. Hind, and communicated to Mr. Gill at the Royal Observatory, Cape of Good Hope, which reached him on November 11, this comet was found the same evening, and was observed on the meridian on several days up to November 19. The first position from a lower transit is as follows:—

	R.A.	Decl.
Nov. 11 ...	12h. 53m. 21s. 74 ...	-65° 57' 28".3

Mr. Gill's observations will allow of a much better determination of the orbit of this comet, than could have been made from the European observations alone; the comet arrived at perihelion on November 13.

GEOGRAPHICAL NOTES

MR. JOSEPH THOMSON sailed yesterday for Zanzibar as leader of the Geographical Society's Expedition to Mount Kenia and the East Coast of the Victoria Nyanza. Mr. Thomson expects to be away for two years.